

REMARKS

Applicant requests the Examiner to withdraw the objection to the disclosure in view of the above corrective amendment to the Abstract. Applicant also requests the Examiner to withdraw the objection to claims 11 and 21 in view of the above corrective amendments thereto.

Applicant respectfully traverses the rejection of claims 11-17, 19 and 21 under 35 U.S.C. § 103(a) as being unpatentable (obvious) over Yang (EP 798844) in view of Janson (US 4,239,092).

Independent **claim 11** is directed to a continuously variable electromagnetic transmission including a commutator-less, axial flux dynamoelectric machine including three main assemblies, namely a stator assembly and two rotors, the two rotors and the stator assembly comprising discoid elements. Discoid elements of the stator assembly and of at least one of the rotors comprise electrical active elements arranged to interact with the other rotor by means of magnetic flux through axial air gaps between respective discoid elements of the three assemblies. According to an aspect of the invention, the transmission includes displacement means for axially displacing at least one of the discoid elements to modify the width of the axial air gap between two interacting discoid elements. Such variation of the axial air gap allows control of the magnetic field in the axial air gap during operation, particularly when the relative speeds vary, thus optimizing the efficiency of the transmission as explained in Applicant's specification on page 7, third and fourth paragraphs.

Furthermore, such axial displacement also allows a mechanical coupling of the two rotors, as specified in **claim 20** and described in the paragraph bridging pages 7 and 8 of Applicant's specification.

The scope of the independent **claim 21** is substantially the same as that of claim 11, except for the shape of the interacting elements, which is not necessarily a discoid shape.

Applicant acknowledges that Yang discloses a transmission having the features set forth in only the first paragraphs of claims 11 and 21, respectively. However, Yang fails to disclose, or even suggest any variation of the "axial air gap" between interacting elements, and particularly, the claimed "displacement means for axially displacing at least one of said" elements to this end.

Janson discloses a tensioning device forming a slip clutch between two rotor assemblies, the first of which includes a generally cylindrical rotatable outer housing 3 having radial grooves on its inner surface, whereas the second assembly includes a substantially cylindrical magnetic assembly 5 positioned in the interior of the outer housing and including a permanent magnet 7. Within the radial space 14 between magnetic assembly 5 and the inner surface of housing 3, two physical radial bridges of magnetic particles 16 are formed by the action of the magnetic flux in front of polar plates 9 and 11 of magnetic assembly 5. A torque is transmitted mechanically from one of the rotors to the other through said bridges, the maximum value of the admissible torque depending upon the strength of the chains or columns formed by the magnetic particles, which is dependent upon the size of radial space 14 (see col. 4, lines 39-54). Applicant notes

that there is no air gap in the regions of space 14 that are crossed by the magnetic field, since the magnetic particles 16 are concentrated in these regions by the field and form solid chains or columns of particles across the space (see col. 3, lines 15-22, and col. 4, lines 26-36).

If these regions were not filled with the magnetic particles, no torque could be transmitted across space 14 since there is no magnetic pole in the outer housing 3. Hence, Applicant respectfully submits that the Examiner has misinterpreted Janson's disclosure when he calls space 14 an "air gap".

A person skilled in the art would thus understand that Janson's device has nothing to do with a dynamoelectric machine. In particular, this person would note the following essential features of Janson's device:

(a) There is no electromagnetic effect in the device, no electric means is present, and all elements are passive.

(b) Transmission of a torque between the rotors is made exclusively by a mechanical way. The function of the magnetic field is exclusively to maintain the mechanical connection between the rotors.

(c) Transmission of the torque between the rotors is effected within a radial space 14, in two regions wherein a radial magnetic field is created.

(d) There is no air gap in said regions, since they are filled with solid particles.

Janson further teaches an adjustment mechanism permitting two different values for the transmissible torque, by increasing or reducing the connection or coupling formed by magnetic

particles 16 between magnetic assembly 5 and outer housing 3. The adjustment mechanism cannot be operated during operation of the slip clutch, but allows two axial positions of magnetic assembly to be manually preset, corresponding to two different values of the radial spacing between elements 3 and 5 in the regions where the magnetic particles are concentrated. Such mechanical adjustment results in two different strengths of the mechanical coupling between the two rotors.

Thus, it is clear that Janson teaches to change the preset value of the maximum torque using, in particular, the following features in a device including the above features (a) to (d) :

(e) Providing grooves in a radial face of one of the rotors to create different radial spacings between elements 3 and 5 in the regions filled by magnetic particles.

(f) Switching from one of said radial spacing to the other by means of an axial displacement of element 5.

Thus, it also is clear that the structure and the operating mode of Janson's device are completely different from the present invention as claimed in the **independent claims 11 and 21**. Basically, a person skilled in the art would not consider obvious, or even possible, to combine Janson's torque adjustment means with a dynamoelectric machine as disclosed by Yang.

Specifically, Janson's disclosure cannot teach varying the thickness of an effective air gap, because there is no effective air gap in his machine. More specifically, Janson teaches changing a radial spacing by an axial displacement, and hence, does not suggest to vary an axial spacing. As a matter of fact, in a machine operating according to Janson's principle, spacing 14

could not be replaced by a variable axial spacing, because the permanent presence of magnetic particles 16 in an axial spacing crossed by a permanent magnetic field would mechanically impede any reduction of the width of the spacing. In other words, the "axial displacement" specified in claims 11 and 21 would be impossible.

Hence, no combination, either obvious or not, of Yang's and Janson's respective disclosures would or could lead to the subject matter of claims 11 or 21.

In the Office Action, the Examiner has based the rejection of **claims 15 and 16** upon the assertion that Yang teaches "various numbers of rotors, e.g. in col. 69, lines 23-32", i.e., in Yang's claim 18. Applicant respectfully traverses this rejection for the following reasons.

Claim 15 substantially specifies that one of the rotors "includes at least two discoid elements", and claim 16 that the "stator assembly includes at least two discoid elements". In view of the description, it is clear that the claimed two discoid elements are not a single operative element, i.e. are distant axially from each other. To better specify this aspect, both claims 15 and 16 are now **amended** to specify that a discoid element of another assembly is located between said two elements.

The cited passage of Yang's disclosure refers to a "common magnetic pole", which may be disk-shaped according to Yang's description (see e.g. Figs. 9-11), and specifies that both sides of the common magnetic pole may be respectively installed with more than one armature. In the context of disk-shaped magnetic poles, this cannot designate anything else than a single disk-shaped element having distinct armatures on its axial sides. Hence, the subject matter of each of

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claims 15 and 16 is not suggested by the combination of Yang's disclosure and Janson's disclosure, and, thus, are patentable per se.

Claims 12-14, 17 and 19 should be considered allowable over Yang and Janson as depending on the allowable claim 11.

Applicant also respectfully traverses the rejection of claims 11-17 and 21 under 35 U.S.C. § 103(a) as being unpatentable (obvious) over Schroedl (WO 99/39426), presumably in view of Janson (US 4,239,092).

Schroedl's disclosure is applied in the Office Action similarly to that of Yang in that it discloses a transmission having the features set forth in the first paragraph of claims 11 and 21, respectively, but fails to disclose or even suggest any variation of the axial air gap between interacting elements, and particularly the claimed displacement means for axially displacing one of said elements to this end.

Hence, Applicant's remarks set forth hereinabove with respect to the combination of Yang's and Janson's respective disclosures quite similarly apply to the combination of Schroedl's and Janson's respective disclosures and need no further argumentation to lead to the conclusion that the independent claims 11 and 21 are allowable over Schroedl and Janson, as well as are theses dependent claims 12-14, 17 and 19.

Applicant notes that claims 18 and 20 would be allowed if they are rewritten in independent form; however, Applicant respectfully requests the Examiner to hold in abeyance

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the rewriting of claims 18 and 20 until the Examiner has had an opportunity to reconsider (and withdraw) the prior art rejection of their parent claims.

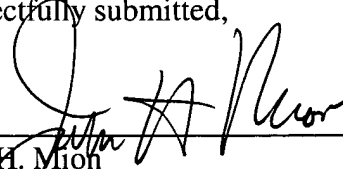
In summary, then, Applicant respectfully requests the Examiner to reconsider and withdraw all objections and rejections and to find the application to be in condition for allowance with all of claims 11-21. However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to **call the undersigned attorney** to discuss any unresolved issues and to expedite the disposition of the application.

Applicant files concurrently herewith a Petition (with fee) for an Extension of Time of one month. Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this application, and any required fee for such extension is to be charged to Deposit Account No. 19-4880. The Commissioner is also authorized to charge any

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additional fees under 37 C.F.R. § 1.16 and/or § 1.17 necessary to keep this application pending in
the Patent and Trademark Office or credit any overpayment to said Deposit Account No. 19-4880.

Respectfully submitted,



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